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Silent video tasks: Towards a definition

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Introduction

This poster presents the development process of assigning silent video tasks and the criteria a video must fulfill to be eligible to be used as a silent video task. Some preliminary results regarding the use of silent video tasks in four different Icelandic upper secondary school mathematics classrooms were presented at PME42 in Umeå, Sweden and at the 5th ERME topic conference MEDA in Copenhagen, Denmark in 2018. These presentations were focused on teachers' role in assigning tasks and using technology in mathematics classrooms; teachers' expectations and experiences with using the silent video task in their classes (Kristinsdóttir et al., 2018). During the discussion at these conferences, it became clear that a more precise definition of the silent videos and the silent video tasks was needed. This poster presents results of further work towards such definitions.

Using silent video tasks in the classroom

The process of assigning a silent video task involves selecting a silent video; showing this video to the whole class; giving students the link to the video to watch as often as they want; dividing them into groups of two; and asking each group to prepare and record their voice-over for the video. The teacher acts as a facilitator, encouraging students e.g. by asking them to bear in mind that their solution might help their peers to gain access to the mathematics shown in the video. In order not to restrict this open task in any way, no list of concepts for students to address should be handed out. In case students find it hard to start recording, a suggestion for them to draft a script might be helpful.

By only assigning the task something might be gained, but to reach the full potential of the task, discussing the solutions in a follow-up lesson is key. By listening to the students' solutions, the teacher prepares a whole-group discussion for the follow-up lesson. Usually the range of solutions shows how differently students think about what is presented in the video. Either the teacher selects some solutions to show in the follow-up lesson (e.g. if there is a sequence of solutions ranging from everyday language to a more formal mathematical language) or asks students to volunteer for presenting some example solutions. The preparation involves listening for topics to address in the follow-up lesson discussions, e.g. different levels of conceptual understanding and precision in language use. After the whole group discussion, students can be asked to write about their experiences.

The goal is, on the one hand, to encourage students to engage in discussion about the mathematics shown in the video. On the other hand, the goal is to make misunderstandings and imprecise word use accessible to the teacher so that they can be discussed. In this process, students might get aware of that explaining mathematics to others can bring them to understanding it better themselves.

Potentials of the silent video tasks as a tool for formative assessment.

Improving students' learning should be at the forefront of assessment practices (Suurtamm et al., 2016). In silent video tasks, students get the opportunity to explain to others and to receive explanations from their classmates. Students' discourse is encouraged both in the process of preparing students' solutions and in a whole class discussion in the follow-up lesson (Kristinsdóttir et al., 2018).

Even in mathematics classrooms where discussion was seldom or never practiced, silent video tasks showed to be easily implemented, and students put their thoughts into words as they explained the mathematics shown in the video. In the process, they may become aware of aspects of the mathematics that they have not yet fully understood. Also, misunderstandings and imprecise word use can be addressed explicitly by the teacher with reference to the student solutions in the follow-up lesson.

After the follow up lesson, decisions about the next steps in instruction are likely to be better founded and the process could fulfil Wiliam's definition (2011, p. 43) of formative assessment. Wright et al. (2018) list six potentials that technology-based formative assessment strategies have to support learning: providing immediate feedback, encouraging discussion, providing a meaningful way to represent problems and misunderstandings, giving opportunities to use preferred strategies in new ways, help raising issues that were previously not transparent for teachers, and providing different outcomes feedback (Wright et al., 2018, p. 219) and the silent video supports all but the first one.

Requirements for videos used in silent video tasks

To be used in a silent video task, a video should be short (less than 2-3 minutes in total), with no text or sound, and show mathematics dynamically. The theme should be as clear and focused as possible (not try to squeeze in too many things) and the video should offer different descriptions, aiming at exposing the students' different levels of conceptual understanding. Some proofs without words (e.g. <https://ggbm.at/jFFERBdd>) might serve as an example but the video themes are not only restricted to proof. They can also include definitions such as the general definition of the sine and cosine functions using a unit circle (e.g. <https://ggbm.at/BfRqGSKq>) or rules like how the area of a triangle can be calculated (e.g. <https://youtu.be/xnPworcoGcM>). These ideas will be presented in the poster with additional details.

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